Original article

Features of onchocerciasis in two rural villages of southwestern Ethiopia

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Abstract:A clinical and parasitological survey of onchocerciasis in two rural villages, SouthWestern Ethiopia was carried out in March, 1992 using a convenience sampling method. Out of approximately 5000 villagers, 620 persons participated in the study of whom 202 qualified for examination for onchocerca microfilaria. The overall prevalence rate of onchocerciasis based on skin snip examination was 54.5%, (60% Gojeb, 50% Kishe). Twenty four percent had acute skin lesions, while 44.4% had chronic skin lesions of whom 14.4% had nodules. Out of 34 cases of visual impairment, six cases of ocular oncho were identified (four choroidoretinitis, one chronic iritis/cataract and one punctate keratitis). The community microfilarial load was 17.2 and 17.1 mf/mg skin snip for the two villages. The number of microfiliae per mg skin snip ranged between 0 and 382. Itching was reported in 80% of villagers. The epidemiological and clinical features of onchocerciasis along with possible control methods are discussed. [Ethiop. J. Health Dev. 1 995; 9(1) : 81-86]

Introduction

The occurrence of human onchocerciasis in Ketfa and Illubabor regions, South-Western Ethiopia has been reported by Italian workers since 1939 (1, 2, 3, 4). Endemic foci were all reported from Northern Gondar , Northern O'mo and Tigray regions (2, 5, 6).

Nearly one and half million cases of onchocerciasis are estimated to exist in Ethiopia in an area of about 300,875 square kilometers. The population at risk of infection is estimated to be 7.3 million (5). Onchocercias affects populations inhabiting the fertile area of the country and discourages , development schemes due to decrease in labour force and decline in individual productivity which result in the increase of dependency and poverty (5, 7, 8).

The resettlement scheme of the past decade and the large coffee plantation scheme, particularly in southwestern Ethiopia in the same area have resulted in exposing new communities to onchocercal infection (5).

The present study attempts to describe the clinical features of onchocercal infection in two villages in south-Western Ethiopia. Both villages lie along Gojeb and Kishe rivers already known to be the breeding areas of
Simulium damonsum (9).

Methods

The source populations are the dwellers of Gojeb and Kishe villages with a total size of approximately 5000. All persons with complaints of itching, skin lesions,

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Table 1: **Demographic characteristics of subjects examined in Gojeb and Kishe villages, March, 1992**

Occupation	Village				Total	
	Gojeb		Kishe			
	N	%	N	%	N	%
Farmer	17	14.7	58	67.4	75	37.1
Housewife	10	8.6	2	2.3	12	5.9
Student	27	23.3	9	10.5	36	17.8
Dependent	17	14.7	15	17.4	32	15.8
Merchant	16	13.8	0	0	16	7.9
Civil servant	2	1.7	1	1.2	3	1.5
Others	26	22.4	2	2.3	28	13.9
Total	115	100.0	87	100.0	202	100.0

elephantiasis, hernia and visual impairment were identified and appointed for interview and clinical examination. The call was made through the community leaders using a megaphone (convenience sampling method). This method of sampling was selected because it gives a better chance of attendance of subjects with dermatological problems. High school graduated interviewers were selected from the nearest town and trained for one day on the techniques of interviewing and terms used in the questionnaire. The questionnaire
was designed in such a way that selection for onchocercal examination was possible from the respondents' answers.

All skin assessments were made by the same examiner who has two years experience of classifying onchocercal disease. Features of reactive skin lesions (papules, excoriations, dermal oedema and inguinal lymphadenopathy) and chronic signs (hyperkeratosis, dyspigmentation, atrophy and hanging groin) (10) were graded according to severity .The number of onchoceca nodules and perception of itching were recorded. Visual acuity (V A) for each eye was measured using a Snellen illiterate E-chart. Ocular examination was made using an ophthalmoscope and slit lamp microscope by an experienced ophthalmologist (slit lamp microscope was borrowed from Finnish Mission at Shebe Health Center).
The subject was defined blind when the visual acuity (V A) was worse than 3160 in the better eye and visually impaired when the V A is between 6118 and 3160 in the better eye (11).

Skin snips were taken by a senior technician using hypodermic needle (22 gauge) and razor blade from both iliac crests after cleaning with 70% alcohol which were then placed in wells of microtitre plate carrying 0.1 mI normal saline solution. When all wells were full, they were covered with adhesive plaster and incubated for 24 hours at room temperature and were then examined for the presence of microfilariae by another senior laboratory technician (12, 13). The number of microfilariae (mi) per well were counted and recorded. Each skin snip was weighed on an electronic balance to estimate the number of mf per mg skin snip. Furthermore, 20 positive snips were stained and examined for morphological confirmation of the mocro-filariae. The data were entered into a computer using EPi-info programme for analysis

Results

The number of patients who came from the two villages for interview were 620 of whom only 202 (133 male, 69 female) qualified for clinical and parasitological examinations (Table 2). Of the total participants, 42.6% were settlers from Wollo or other Administrative regions who settled 8 years ago while the rest were indigenous population. The majority of the participants (55%) were farmers, and students (Table 1).

Table 2: **Characteristics of subjects examined by age and sex, Gojeb, and Kishe villages, South-Western Ethiopia, March, 1992.**

Age group	Sex		Total	
	M	F	N	(%)
1-4	0	1	1	0.5
5-9	7	5	12	5.9
10-14	25	7	32	15.8

15-19	15	6	21	10.8
20-29	20	14	34	16.8
30-39	35	16	51	25.2
49-49	15	12	26	13.4
50-59	8	6	14	6.9
60+	8	2	10	5.0
All ages	133	69	202	100

Reactive skin lesions were seen in 48/202 (23.8%) whereas 90/202 (44.6%) had chronic skin lesions from mild to severe forms. No hanging groin was seen though few cases were reported from the nearest health centre. Reactive skin lesions were fairly distributed in all age groups whereas the chronic lesions were commoner with increasing age. Excoriations and dyspigmentation were commoner in males than in females. Other features had equal distribution in both males and females.

Nodules were seen in 29/202 (14.4%), the range being 1-6 and mostly found on the pelvic area. Nodules were fcund in all age groups but more in males. Visual impairment was reported in 34/202 (16.8%) of whom six were identified as cases of ocular oncho (four early choroidoretinitis, one chronic iritis and one punctate keratitis/cataract). Blindness was bbserved in two patients which is attributed to cararact and glaucoma.

The overall parasitological prevalence rate was 110/202 (54.5%) (600% Gojeb, and 50% Kishe). The prevalen~ rate in males was 59.4% and 44.9%; in females and no significant difference was observed .({1.>0.05). The community microfilarial load (CMFL) was (the geometric mean microfilarial count) was 17.2 f and 17.1 mf/mg skin snip (14) for Gojeb and Kishe, respectively. The parasitological prevalence and arithmetic mean for Microfilarial Count (MFC) steadily increased with age (Table 4). The microfilarial count
(mt) ranged between ° and 382 per mg skin snip out of which 4.1% had a count of 100 mf or more per mg skin snip. However, the arithmetic mean is 16.6 mf/mg skin snip (Table 4). There was no association between severity of reactive skin lesions and microfilarial count ($p > 0.05$), and between severity of hyperkeratosis and mf count ($p > 0.05$). On the other hand, a strong association between dyspigmentation and mf count was observed ($p < 0.005$).

Discussion

This study was carried out in areas with hyperendemic onchocerciasis (Asefa A. , et al. , 1990, unpublished data). The clinical manifestation of the disease is of moderate intensity most probably

due to the recent infection of nearly half of the study subjects. Parasitological and clinical measures of the disease increased steadily with age, suggesting that there was little effective immunity within these communities and that infection accumulated with increasing years of exposure. The disease is perceived as a health problem by the minority of the villagers, of whom 46/202 (22.8%) had sought treatment for onchocerciasis.

Both clinical manifestations and parasitological findings between our subjects and those of Seyoum et al (13) seem to be different being higher in our case. This could be due to differences in the study methodologies and ecology .The absence of scrotal elephantiasis, and hanging groin in our case may be due to recent infection of the subjects in the two villages (the majority of the subjects settled there eight years ago) or patients with such manifestations did not appear for the examination. The overall prevalence rate is similar to our previous work (54.4% vs 61.2%) despite the fact that the study designs are different (Asefa A. , et al, 1990, unpublished data). The prevalence rate for females is higher than reported from Bebeka Coffee Plantation Enterprise by Seyoum et al (13) .This might be because of the. occupational difference between the two study populations.

The two cases of blindness are probably attributed to non-onchocercal glaucoma and cataract whereas six cases of the 34 with visual impairment are suspected to be due to ocular onchocerciasis. A survey conducted in southwestern Ethiopia revealed that, of 428 cases of reduced vision, four were attributed to onchocerciasis (26,27). However, that survey was conducted more than a decade ago which may not be representative for the present epidemiological and clinical conditions of onchocerciasis in Ethiopia. In this context, as recommended by Zein & Kloos (27), the role of onchocerciasis in the etiology of blindness in Ethiopia has yet to be determined by conducting a country representative survey.

Reactive skin lesions are higher compared to some of the reports from West Africa (15, 16, 17) but chronic skin lesions are lower compared to the same exposure to the disease in our case. However, itching was reported in similar proportion of the study population. According to Anderson (18), microfilarial count of 100 or more per mg skin snip is regarded as heavy infection. In this case, 4 % of the study population showed heavy infection. Therefore, it can safely be concluded that onchocerciasis in the two villages is hyperendemic with mild to moderate intensity .

This study has not measured disabilities due to onchocerciasis which indirectly measures productivity of the victims. However, it depicts that onchocerciasis is a health problem of the villagers calling for appropriate intervention. Identification of the responsible vector must be made and their breeding sites located. Furthermore, the annual transmission potential of the vector(s) must be estimated in order to plan an effective intervention programme. Currently, several studies have indicated that treatment with ivermectin (mectizan) has proved to decrease the intensity of infection and clinical symptoms if administered biannually in a single dose. This same treatment scheme is also said to lower the transmission of onchocerciasis if given over several years (19, 20, 21). Duke et al (20) have found that ivermectin was effective in preventing embryogenesis to the microfilarial stage while, at the same time, it caused a slow but steady attrition of the adult worms. In countries like Ethiopia, where other control measures are not feasible, ivermectin may be used both for the control and treatment of onchocerciasis.

Table 3: **Clinical sings of onchocerciasis and association of mf count with various lesions (N=202)**

Signs	No			
Reactive skin signs	48	23.8	0.527	0.605582
Papules	19	9.4	0.03	0.86889
excoriations	41	20.3	3.16	0.05729
dermal oedema	4	2.0	0.13	0.71444
lymphadenopathy	19	4.5	0.01	0.92818
Chronic skin lesions	90	44.6	4.940	0.026236
hyperkeratosis	23	10.4	1.59	0.20743
dyspigmention	46	22.8	7.41	0.00648
dermal atrophy	74	36.6	0.37	0.54559
Blind	2	1.0		
Visual impairmanet	34	16.8		
Itching	162	80.2		
Nodule	29	14.4	7.96	0.00478

Table 4: **Prevalence and intensity of microfilariae by sex and age group**

Age group	Male		Female		Total		Mean*
	+ve	-ve	+ve	-ve	+ve	-ve	
1-4	-	-	-	1	-	1	0.0

5-9	2	5	3	2	5	7	1.5
10-14	10	15	4	3	14	18	9.8
15-19	6	9	3	3	9	12	10.7
20-29	11	9	5	9	16	18	8.7
30-39	24	11	5	11	29	22	21.3
40-49	12	3	5	7	17	10	10.2
50-59	8	0	5	1	13	1	40.1
60+	6	2	1	1	7	3	64.3
Total	79	54	31	37	110	91	16.6

* Arithmetic mean of MFL load (mf/mg sking snip)

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